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WATER SUPPLY OUTLOOK FOR COLORADO AND NEW MEXICO

and
FEDERAL-STATE-PRIVATE COOPERATIVE SNOW SURVEYS

AS OF
MAY 1, 1980



U.S. DEPARTMENT of AGRICULTURE * SOIL CONSERVATION SERVICE

Collaborating with
COLORADO STATE UNIVERSITY EXPERIMENT STATION
STATE ENGINEER of COLORADO
and STATE ENGINEER of NEW MEXICO

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SNOW SURVEY UNIT
P.O. BOX 17107
DENVER, COLORADO 80217

SNOW SENSOR RESEARCH PROJECT

The snow survey section of the Soil Conservation Service (SCS) has committed itself to upgrading the accuracy of water supply forecasts. In an effort to improve forecasts the SCS and Colorado State University (CSU) have entered into a cooperative agreement to investigate the performance of automated and manual methods of snow measurement.

To accomplish this task a field study area has been established at the Columbine SNOTEL site near Rabbit Ears Pass, approximately 15 miles southeast of Steamboat Springs. This site, along with engineering research facilities at CSU will greatly enhance our ability to test and verify current methods of snow measurement as well as develop new ones.

Current tests include verification of manual measurement equipment and testing of several designs and configurations of snow pillows.

During the period of April 21-23, 1980, the Columbine site was the scene of a large field verification of snow pillow measurements. Four sets of pillows in different configurations were excavated by eight men. The snow on top of each pillow was weighed. Approximately 60 tons of snow was removed in 2½ days. The snow water content of each pillow configuration was then calculated from the weight of the snow excavated. Preliminary results indicate certain pillow configurations exhibited a tendency to overweigh under the conditions investigated. (See photo on Page 7.)

"The Conservation of Water begins with the Snow Survey"

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PROJECT ACTION
CURRENT SERIAL RECORDS

WATER SUPPLY CONDITIONS as of

MAY 1, 1980

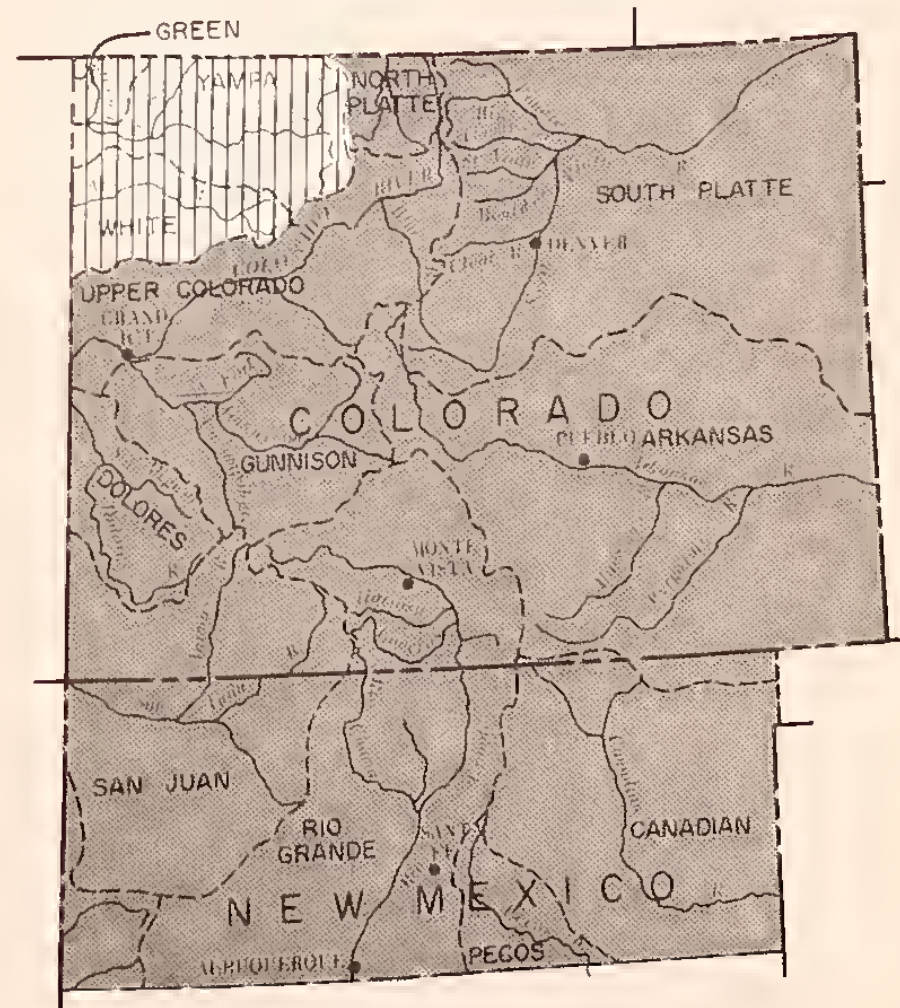
THE STATUS OF THE MOUNTAIN SNOWPACK AND PREDICTED STREAMFLOWS HAS NOT CHANGED APPRECIABLY FROM THE OUTLOOK REPORTED A MONTH AGO. IN SEVERAL RIVER BASINS SNOWPACK AVERAGES HAVE INCREASED FROM LAST MONTH BUT THIS IS MORE A CONSEQUENCE OF BELOW NORMAL MELT RATHER THAN ABNORMALLY HIGH PRECIPITATION. ALL APPRECIABLE MELT WHICH CONTRIBUTED TO RUNOFF DIRECTLY DURING APRIL OCCURRED AT ELEVATIONS BELOW 9000 FEET. SNOW SURVEYS WILL BE TAKEN AT ABOUT 30 LOCATIONS ON MAY 15 AND JUNE 1 TO ASSESS THE PROGRESS OF MELT. STREAMFLOW FORECASTS ARE A JOINT EFFORT OF THE SOIL CONSERVATION SERVICE AND THE NATIONAL WEATHER SERVICE.



COLORADO -- STREAMFLOW IS ANTICIPATED TO BE 25-100% ABOVE NORMAL ON ALL MAJOR WATERSHEDS. THE HIGHEST SNOWPACK AND PROJECTED SEASONAL STREAMFLOW VOLUMES ARE IN SOUTHWEST AND SOUTH CENTRAL COLORADO. HEADWATERS OF THE COLORADO SHOULD FLOW 30-40% ABOVE NORMAL AS WILL MOST STREAMS ORIGINATING ON THE EAST FLANKS OF THE FRONT RANGE. THE ARKANSAS BASIN IS EXPECTED TO FLOW 65% ABOVE NORMAL. AN EXCELLENT WATER SUPPLY SHOULD BE AVAILABLE THROUGHOUT THE STATE THIS SPRING AND SUMMER.



NEW MEXICO -- HEADWATERS OF THE RIO GRANDE BOTH IN COLORADO AND NEW MEXICO HAVE SNOWPACKS WHICH ARE FAR ABOVE NORMAL. HEAVY PRECIPITATION AMOUNTING TO BETWEEN TWO AND THREE TIMES NORMAL OCCURRED IN NORTHERN NEW MEXICO DURING APRIL. THE RIO GRANDE AT OTOWI AND THE RIO CHAMA ARE FORECAST TO FLOW ABOUT 275% OF NORMAL THROUGH JULY. OTHER SMALLER STREAMS ARE FORECAST TO FLOW 50 TO 75% ABOVE AVERAGE. SNOWPACK IN THE RIO CHAMA REMAINS ONLY SLIGHTLY BELOW MAXIMUM OF RECORD. STREAMFLOW DURING MAY SHOULD BE EXCEPTIONALLY HIGH FROM MOST SMALL TRIBUTARIES TO THE RIO GRANDE.



LEGEND
▲ Forecast Point
Watershed Boundaries
STREAMFLOW FORECASTS
Percent of 1963-77 Average
Over 130%
110-130%
90-110%
70-90%
Under 70%

The map on this page indicates the most probable water supply as of the date of this report. Estimates assume average conditions of snow fall, precipitation and other factors from this date to the end of the forecast period. As the season progresses accuracy of estimates improve. In addition to expected streamflow, reservoir storage, soil moisture in irrigated areas, and other factors are considered in estimating water supply. Estimates apply to irrigated areas along the main streams and may not indicate conditions on small tributaries.

1.7
B.3

GUNNISON RIVER WATERSHED IN COLORADO



YOUR WATER SUPPLY

SNOWPACK IN THE GUNNISON BASIN HAS RISEN FROM 153% OF NORMAL TO 159% OF NORMAL. THIS IS A CONSEQUENCE OF NEAR AVERAGE PRECIPITATION BUT BELOW NORMAL MELT DURING APRIL. MUCH OF THE 2-4 INCHES OF MELT PRODUCED ABOVE 9000 FEET WENT INTO THE GROUND AND PRODUCED LITTLE RUNOFF. POTENTIAL FOR FLOODING IN LOW-LYING AREAS ALONG SNOWED STREAMS REMAINS HIGH PARTICULARLY IN THE NORTH FORK OF THE GUNNISON AND ABOVE CRESTED BUTTE. STREAMFLOW SHOULD REMAIN HIGH LATER THAN NORMAL THIS SPRING.

STREAMFLOW FORECASTS (1000 AC. FT.) April - September

FORECAST POINT	Forecast	% of Average	1963-77 Average
Gunnison River inflow to Blue Mesa Reservoir (1)	1200	159	754.0
Gunnison River near Grand Junction (2)	1800	157	1150.0
North Fork of Gunnison (3)	450	1191	212.0
Surface Creek near Cedaredge	23	151	15.1
Uncompahgre River at Colona	170	132	129.0

(1) Observed flow plus change in storage in Taylor Reservoir. (2) Observed flow plus change in storage in Blue Mesa, Morrow Point and Taylor Reservoirs. (3) Observed flow plus change in storage in Poncha Reservoir.

WATER SUPPLY OUTLOOK

STREAM or AREA	Flow Period	
	Spring Season	Long Season
Ohio Creek	Exc.	Exc.
Slate River	Exc.	Exc.
Taylor River	Exc.	Exc.
Tomichi Creek	Exc.	Exc.

RESERVOIR STORAGE (Thousand Ac. Ft.) END OF MONTH

Basin or Stream and or RESERVOIR	Usable Capacity	Usable Storage		1963-77 Average
		THIS YEAR	LAST YEAR	
Blue Mesa	830	347	274	320
Morrow Point	121	117	115	105
Taylor	106	48	43	60

LIST OF COOPERATORS

The following organizations cooperate in snow surveys for the Colorado, Platte, Arkansas and Rio Grande watersheds. Many other organizations and individuals furnish valuable information for the snow survey reports. Their cooperation is gratefully acknowledged.

STATE

Colorado State Engineer
 Colorado State Soil Conservation Board
 New Mexico State Engineer
 Colorado State University Experiment Station
 Rocky Mountain Forest and Range Experiment Station
 New Mexico Dept. of Game and Fish
 University of Colorado, INSTAAR

FEDERAL

Department of Agriculture
 Forest Service
 Soil Conservation Service
 Department of Interior
 Bureau of Reclamation
 Geological Survey
 National Park Service
 Department of Commerce
 NOAA, National Weather Service
 Defense Department
 Army Engineer Corps
 National Aeronautics and Space Administration
 Gaddard Space Flight Center

INVESTOR OWNED UTILITIES

Colorado Public Service Company
 Public Service Company of New Mexico

MUNICIPALITIES

City of Denver
 City of Boulder
 City of Greeley
 City of Fort Collins

SUMMARY of SNOW MEASUREMENTS

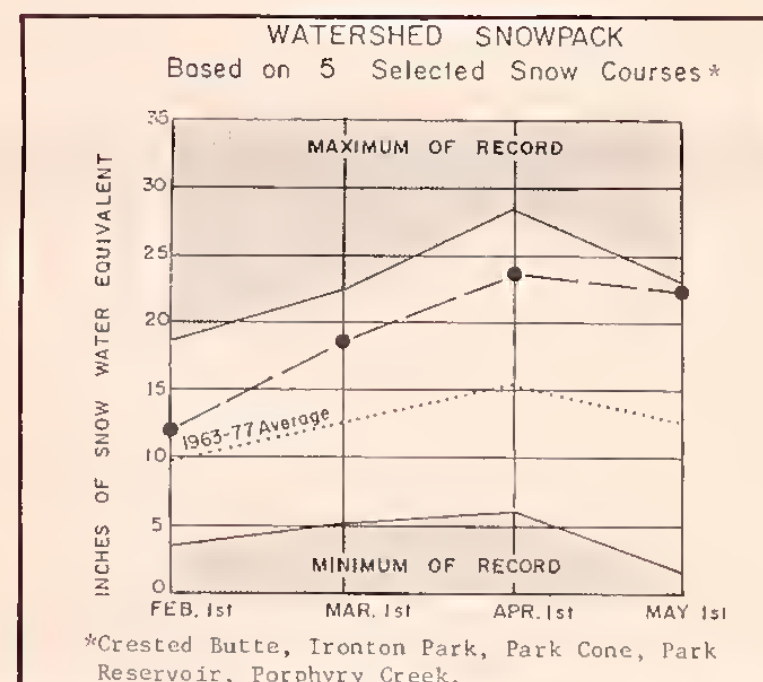
(COMPARISON WITH PREVIOUS YEARS)

RIVER BASIN AND SUBWATERSHED	Number of Courses Averaged	THIS YEAR'S SNOW WATER AS PERCENT OF	
		LAST YEAR	1963-77 Average
Gunnison	13	105	171
Surface Creek	3	100	149
Uncompahgre	3	85	132

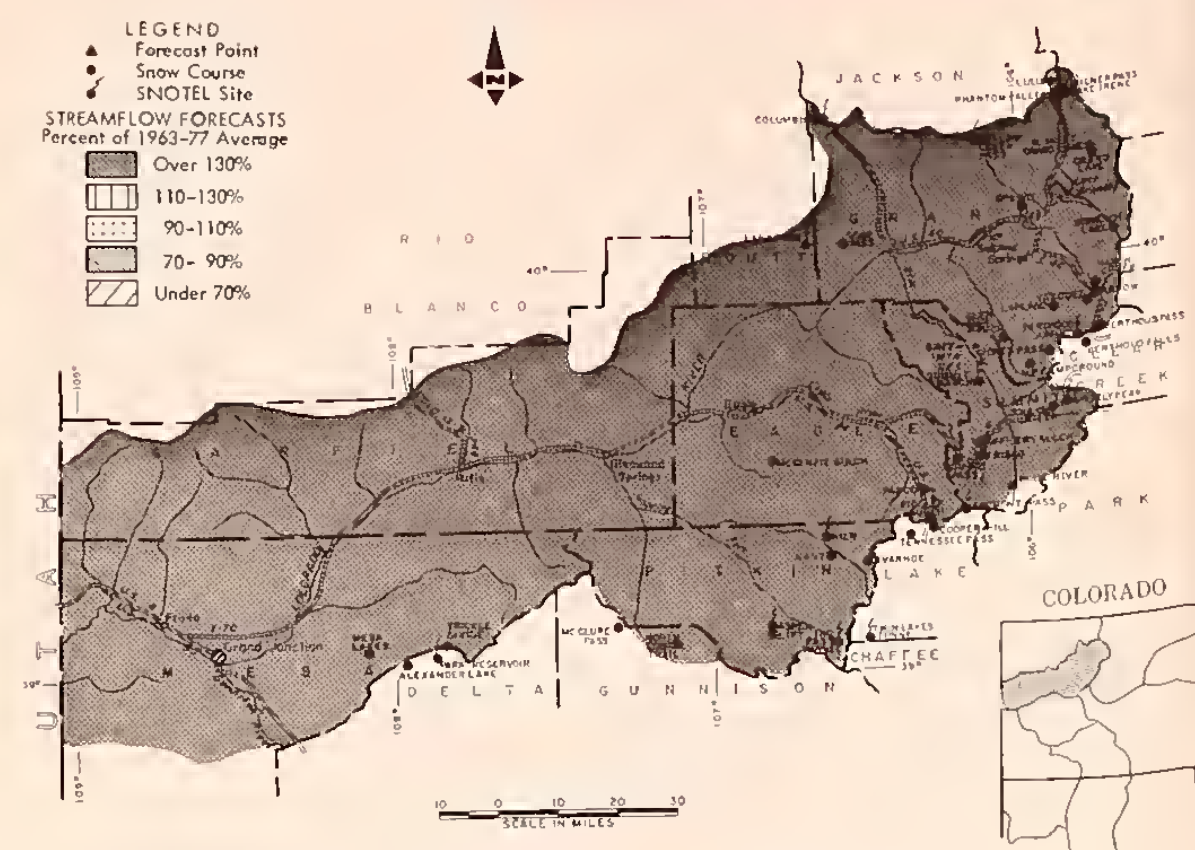
SNOW COURSE MEASUREMENTS

SNOW COURSE	DATE OF SURVEY	SNOW DEPTH (INCHES)	CURRENT INFORMATION		PAST RECORD	
			SNOW DEPTH (INCHES)	WATER CONTENT (INCHES)	LAST YEAR	AVG. 1963-77
GUNNISON BASIN						
<u>Gunnison River</u>						
Alexander Lake	4/29	65	32.4	33.2	21.5	
Blue Mesa	4/28	20	6.4	5.2	2.7	
Butte	4/29	52	22.9	22.9	12.3	
Cochetopa Pass (B)	4/28	23	7.5	7.4	4.0	
Crested Butte	4/29	39	26.3	21.6	7.2	
Keystone	4/29	59	28.6	29.0	17.0	
Lake City	4/25	29	7.3	8.2	4.6	
Mesa Lakes (B)	4/29	48	21.5	23.8	15.7	
McClure Pass	4/24	45	18.7	19.9	9.9	
Park Cone	4/29	33	13.1	9.4	6.8	
Park Reservoir	4/28	79	36.2	35.2	23.2	
Porphyry Creek	4/29	59	23.3	18.5	16.2	
Slumgullion	4/25	58	18.0	16.6	---	
Tomichi	4/29	37	14.4	11.8	10.3	
<u>Surface Creek</u>						
Alexander Lake	4/29	65	32.4	33.2	21.5	
Mesa Lakes	4/29	48	21.5	21.6	15.7	
Park Reservoir	4/28	79	36.2	35.2	23.2	
<u>Uncompahgre River</u>						
Idarado	4/29	34	13.7	16.4	---	
Ironton Park	4/29	29	11.9	13.8	8.0	
Red Mountain Pass	4/28	91	38.8	46.1	31.9	
Telluride (B)	4/25	14	5.5	6.0	2.5	

(A) - N. slope.
 (B) - N. adjacent drainage.



COLORADO RIVER WATERSHED IN COLORADO



YOUR WATER SUPPLY

FORECASTS HAVE NOT CHANGED MUCH FROM A MONTH AGO EVEN THOUGH BELOW NORMAL. PRECIPITATION WAS EXPERIENCED AT LOWER ELEVATIONS OVER MUCH OF THE BASIN. AT HIGHER ELEVATIONS BELOW NORMAL MELT OCCURRED DURING APRIL COUPLED WITH NEAR NORMAL PRECIPITATION. AS A RESULT, THE MOUNTAIN SNOWPACK INCREASED 5 TO 20% AS A PERCENT OF AVERAGE FOR THIS TIME OF YEAR. STORAGE IN MAJOR RESERVOIRS IN THE UPPER COLORADO IS 52% HIGHER THAN A YEAR AGO AND 9% ABOVE NORMAL.

STREAMFLOW FORECASTS (1000 AC. FT.) April - September

FORECAST POINT	Forecast	% of Average	1963-77 Average
Blue River inflow to Dillon Reservoir	225	135	167.0
Blue River inflow to Green Mountain Reservoir (1)	390	136	287.0
Colorado River near Cameo (2)	3400	146	2336.0
Colorado River near Dotsero (3)	1950	137	1422.0
Colorado River inflow to Granby Reservoir (4)	300	138	218.0
Eagle River below Gypsum	432	145	298.0
Roaring Fork at Glenwood Springs (5)	955	137	697.0
Williams Fork near Parshall (6)	96	163	59.0
Willow Creek inflow to Willow Creek Reservoir	65	135	48.0

(1) Observed flow plus change in storage in Dillon Reservoir. (2) Observed flow plus change in storage in Green Mountain Reservoir. (3) Observed flow plus change in storage in Lake Inland. (4) Observed flow plus change in storage in Granby Reservoir. (5) Observed flow plus change in storage in Glenwood Springs Reservoir. (6) Observed flow plus change in storage in Willow Creek Reservoir.

RESERVOIR STORAGE (Thousand Ac. Ft.) END OF MONTH

Basin or Stream and or RESERVOIR	Usable Capacity	Usable Storage		1963-77 Average
		THIS YEAR	LAST YEAR	
Dillon	254	226	161	199
Granby	466	245	87	215
Green Mountain	139	41	57	48
Homesake	43	10	3	12
Ruedi	101	53	51	57
Vega	32	13	12	15
Williams Fork	97	47	44	36
Willow Creek	9	8	7	6

WATER SUPPLY OUTLOOK

STREAM or AREA	Flow Period	
	Spring Season	Long Season
Brush	Exc.	AVG.
Gypsum Creek	Exc.	AVG.

SUMMARY of SNOW MEASUREMENTS

(COMPARISON WITH PREVIOUS YEARS)

RIVER BASIN AND SUBWATERSHED	Number of Courses Averaged	THIS YEAR'S SNOW WATER AS PERCENT OF	
		LAST YEAR	1963-77 Average
Blue River	8	144	147
Colorado	20	106	143
Plateau	3	100	149
Roaring Fork	8	108	140
Williams Fork	3	134	154
Willow	2	75	132

SNOW COURSE MEASUREMENTS

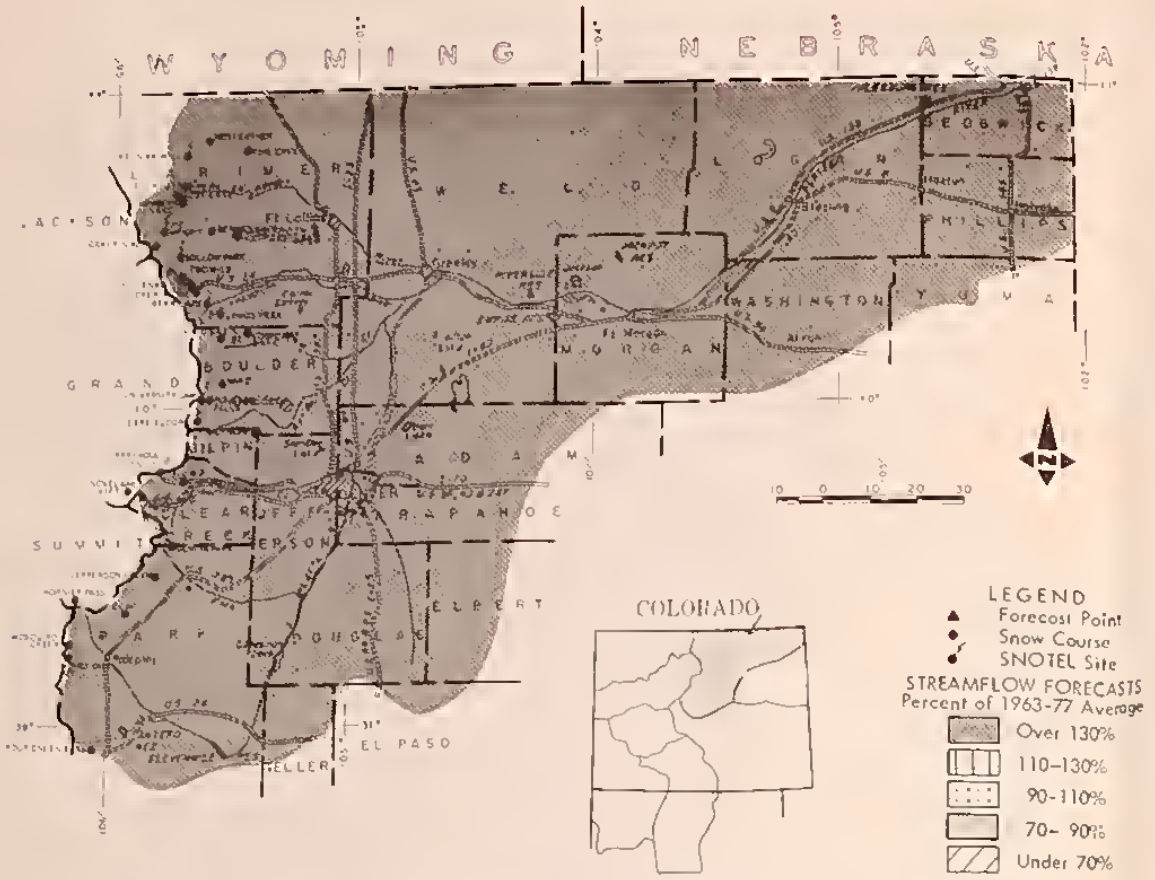
SNOW COURSE	DATE OF SURVEY	SNOW DEPTH (INCHES)	CURRENT INFORMATION		PAST RECORD	
			SNOW DEPTH (INCHES)	WATER CONTENT (INCHES)	LAST YEAR	AVG. 1963-77
COLORADO BASIN						
<u>Blue River</u>						
Blue River	4/30	42	12.8	4.2	5.5	
Fremont Pass	4/28	63	23.4	17.0	17.7	
Grizzly Peak	4/24	64	21.7	18.8	19.5	
Hoosier Pass	4/30	53	19.6	14.7	12.3	
Officers Gulch	4/24	26	7.9	4.6	4.8	
Shrine Pass	4/28	60	21.6	18.0	19.0	
Snake River	4/25	28	9.4	4.8	3.5	
Summit Ranch	4/28	28	10.6	6.9	5.2	
Ute Pass				6.1	---	
<u>Colorado River</u>						
Arrow	4/29	41	17.0	16.7	11.5	
Berthoud Pass	4/28	56	22.0	19.9	15.7	
Berthoud Summit	4/29	66	25.4	23.9	20.5	
Cooper Hill	4/28	52	17.9	14.4	11.7	
Copper Mountain	4/24	54	17.0	12.2	---	
Glenmar Ranch	4/28	18	7.0	5.4	4.6	
Gore Pass	4/28	24	9.1	11.2	7.7	
Grand Lake	4/26	30	11.0	11.2	5.0	
Lake Irene	4/26	72	29.0	27.9	21.9	
Lapland	4/30	31	10.9	7.9	7.5	
Lulu	4/26	70	27.7	27.4	20.4	
Lynx Pass	4/28	28	10.5	13.0	8.7	
McKenzie Gulch	4/28	9	2.7	2.3	1.7	
Middle Fork	4/28	28	10.7	8.4	6.3	
Milner	4/26	45	16.2	17.3	12.4	
North Inlet	4/27	30	9.9	11.6	6.3	
Pando	4/28	28	8.9	8.4	7.8	
Phantom Valley	4/26	36	14.2	14.4	7.1	
Ranch Creek	4/29	37	14.0	13.1	9.5	
Tennessee Pass (B)	4/28	37	12.4	11.5	7.4	
Vail Mountain	4/25	71	28.6	27.8	---	
Vasquez	4/30	38	18.8	13.4	12.6	
<u>Plateau Creek</u>						
Mesa Lakes	4/29	48	21.5	23.8	15.7	
Park Reservoir	4/28	79	36.2	35.2	23.2	
Trickle Divide	4/28	81	39.7	38.6	26.4	
<u>Roaring Fork</u>						
Aspen	4/28	53	19.0	18.5	18.4	
Independence Pass	4/29	55	22.3	19.5	15.7	
Ivanhoe	4/23	57	21.4	19.8	18.3	
Kila	4/23	40	14.0	13.0	10.7	
Lift	4/28	58	23.8	22.2	18.6	
McClure Pass	4/24	45	18.7	19.9	9.9	
Nast	4/23	17	5.8	3.0	2.4	
North Lost Trail	4/24	44	18.2	16.6	8.6	
<u>Williams Fork River</u>						
Glenmar Ranch	4/28	18	7.0	5.4	4.6	
Jones Pass	4/25	56	23.1	16.6	15.6	
Middle Fork	4/28	28	10.7	8.4	6.3	
Ute Pass	4/29	25	10.2	6.1	---	
<u>Willow Creek</u>						
Granby	4/29	19	6.3	8.6	4.4	
Willow Creek Pass	4/29	38	13.7	18.0	10.8	

(A) - No survey.
 (B) - On adjacent drainage.



1.9
B.3

SOUTH PLATTE RIVER WATERSHED IN COLORADO



YOUR WATER SUPPLY

NEAR TO SLIGHTLY ABOVE NORMAL PRECIPITATION IN THE HEADWATERS OF THE SOUTH PLATTE COUPLED WITH BELOW NORMAL SNOWMELT DURING APRIL HAVE PUSHED SEASONAL SNOWPACK FIGURES TO NEW HIGHS. SNOWPACK NOW RANGES FROM NEAR 25% ABOVE NORMAL IN THE CACHE LA POUDE TO 91% ABOVE NORMAL IN THE HIGHER ELEVATIONS OF SOUTH PARK. RESERVOIR STORAGE REMAINS ABOVE NORMAL THROUGHOUT THE BASIN. STREAMFLOW FORECASTS RANGE FROM 25-44% ABOVE NORMAL. SOIL MOISTURE AT ALL ELEVATIONS IS EXCELLENT AS A RESULT OF SNOWMELT AND HEAVY RAINS.

STREAMFLOW FORECASTS (1000 Ac. Ft.) April - September

FORECAST POINT	Forecast	% of Average	1963-77 Average
Bear Creek at Morrison	36	128	18.0
Big Thompson River at Drake (1)	130	127	162.4
Boulder Creek at Orodell	60	133	45.1
Cache La Poudre River at Canyon Mouth (2)	350	144	243.0
Clear Creek at Golden (3)	148	123	120.0
St. Vrain Creek at Lyons	100	140	71.6
South Platte River at South Platte	260	135	193.0

(1) Observed flow plus forecast to power plants. (2) Observed flow minus trans-basin diversions plus municipal and irrigation diversions. (3) Observed flow minus diversion through August 31. See last issue.

WATER SUPPLY OUTLOOK

STREAM or AREA	Flow Period	
	Spring Season	Late Season
Coal Creek	Exc.	Avg.
North Fork of South Platte	Exc.	Exc.
North Fork of Cache La Poudre	Exc.	Exc.
Ralston Creek	Exc.	Avg.
Rock Creek	Exc.	Avg.
South Platte from Greeley to Fort Morgan	Exc.	Exc.
South Platte from Fort Morgan to Sterling	Exc.	Exc.
South Platte below Sterling	Exc.	Exc.

RESERVOIR STORAGE (Thousand Ac. Ft.) END OF MONTH

Basin or Stream and Reservoir	Usable Storage			
	Thous. Ac. Ft.	Thous. Ac. Ft.	Thous. Ac. Ft.	1963-77 Average
Antero	16	16	14	
Barr Lake	32	30	26	
Black Hollow	8	6	4	
Boyd Lake	44	49	38	
Cache La Poudre	10	10	8	
Carter Lake	109	107	103	
Chambers Lake	9	6	3	
Cheesman	79	79	49	
Cobb Lake	34	21	4	
Eleven Mile	98	98	91	
Empire	38	30	34	
Fossil Creek	12	6	8	
Gross	43	19	16	
Halligan	6	6	3	
Horsetooth	144	135	114	
Jackson	35	32	35	
Julesburg	28	23	24	
Lake Loveland	14	12	9	
Lone Tree	9	8	7	
Mariano	5	5	5	
Marshall	10	9	9	
Marston	17	16	15	
Hilton	24	16	20	
Point of Rocks	70	70	70	
Prewitt	33	28	29	
Riverside	58	52	58	
Standley	42	41	34	
Terry	8	3	6	
Union	13	13	13	
Windsor	19	15	15	



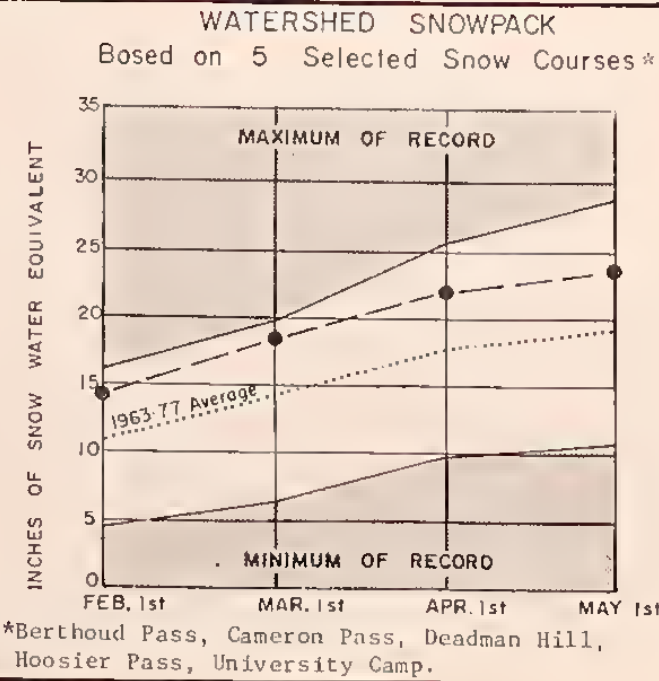
SUMMARY of SNOW MEASUREMENTS

RIVER BASIN and SUB-WATERSHED	Number of Courses Averaged	THIS YEAR'S SNOW WATER AS PERCENT OF	
		1963-77 Average	1963-77 Average
Big Thompson	5	112	137
Boulder	3	158	156
Cache La Poudre	9	105	123
Clear Creek	5	148	144
Saint Vrain	3	130	177
South Platte	7	152	191

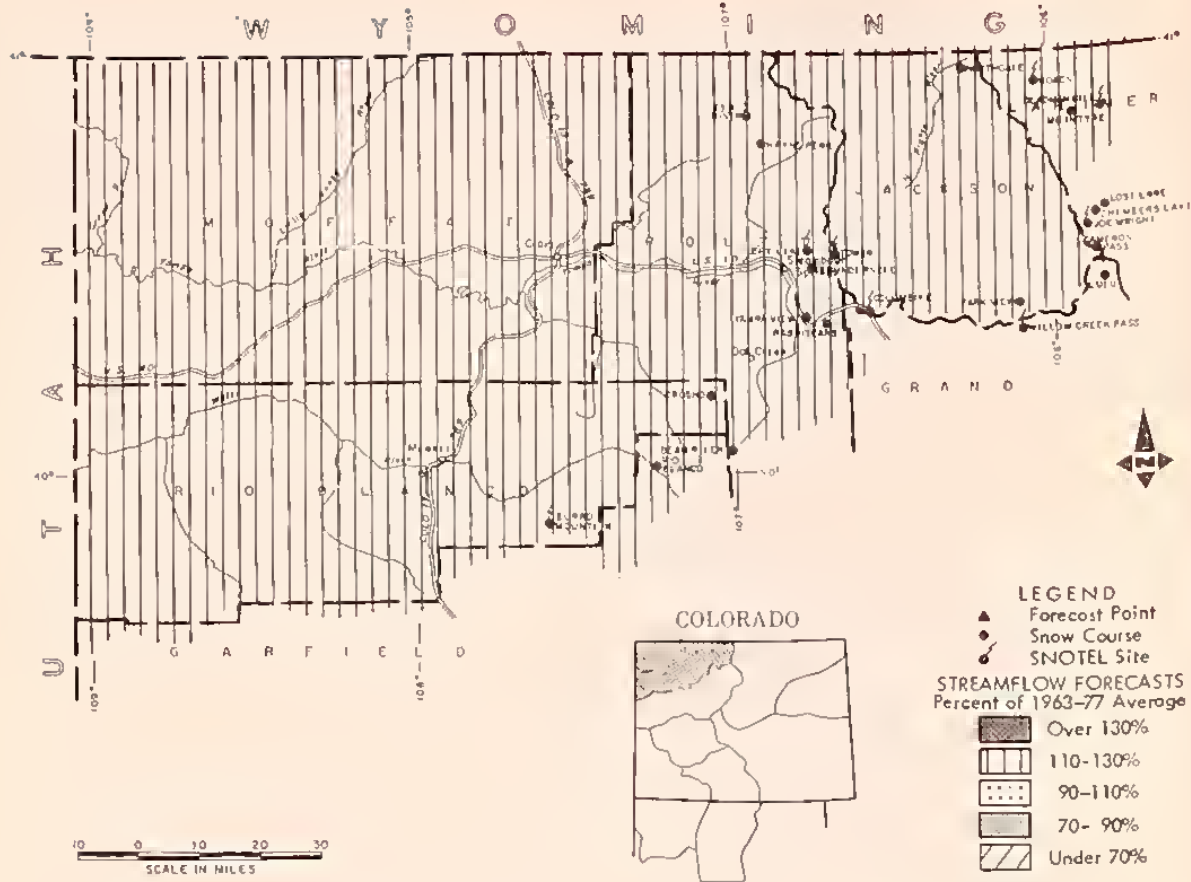
SNOW COURSE MEASUREMENTS

SNOW COURSE	CURRENT INFORMATION			PAST RECORD	
	DATE OF SURVEY	SNOW DEPTH (INCHES)	WATER CONTENT (INCHES)	LAST YEAR	AVG. 1971-77
SOUTH PLATTE BASIN					
<u>Boulder Creek</u>					
Baltimore	4/29	32	10.4	4.2	4.5
Boulder Falls	4/29	55	20.2	13.6	12.5
Lake Eldora	4/29	40	15.3	11.0	---
University Camp	4/27	67	24.7	17.3	18.4
<u>Big Thompson River</u>					
Bear Lake	4/27	62	21.6	21.3	---
Deer Ridge	4/27	22	7.7	3.0	2.7
Hidden Valley	4/27	42	13.7	11.1	10.0
Lake Irene (B)	4/26	72	29.0	27.9	21.9
Long's Peak	4/28	49	16.1	16.4	12.3
Two Mile	4/27	65	20.9	19.3	16.9
Willow Park	4/28	71	29.9	27.8	---
<u>Cache La Poudre</u>					
Bennett Creek	4/30	31	10.0	8.1	5.1
Big South	4/28	0	0.0	0.0	0.6
Cameron Pass	4/28	68	31.0	31.0	32.1
Chambers Lake	4/28	24	10.8	10.9	6.4
Deadman Hill	NS	---	---	20.8	17.8
Hourglass Lake	4/29	29	9.9	9.6	6.4
Joe Wright	4/28	73	31.1	30.2	28.8
Lost Lake	4/28	36	14.1	13.3	9.6
Red Feather	4/29	23	9.6	7.2	5.5
<u>Clear Creek</u>					
Baltimore (B)	4/29	32	10.4	4.2	4.5
Berthoud Falls	4/29	55	20.2	12.2	11.9
Empire	4/29	37	11.6	8.9	7.4
Grizzly Peak (B)	4/24	64	21.7	18.8	19.5
Loveland Pass	4/24	55	19.6	12.4	14.6
<u>St. Vrain River</u>					
Copeland Lake	4/26	27	8.3	3.6	2.8
Ward	4/29	29	8.9	6.4	5.5
Wild Basin	4/26	52	17.8	17.0	11.5
<u>South Platte River</u>					
Bison Reservoir	4/28	25	8.6	5.4	---
Como	4/29	26	9.1	5.4	5.2
Geneva Park	4/29	18	4.8	0.0	2.1
Horseshoe Mountain	4/30	53	17.7	13.0	10.4
Hoosier Pass	4/30	53	19.6	14.7	12.3
Jefferson Creek	4/29	35	14.1	9.7	8.0
Mosquito	4/30	45	15.9	9.4	6.1
Niwot	NS	---	---	---	---
Trout Creek Pass	4/29	19	7.7	5.6	1.9

NS-No survey.
(B)-On adjacent drainage.



YAMPA, WHITE AND NORTH PLATTE RIVER WATERSHEDS IN COLORADO



YOUR WATER SUPPLY

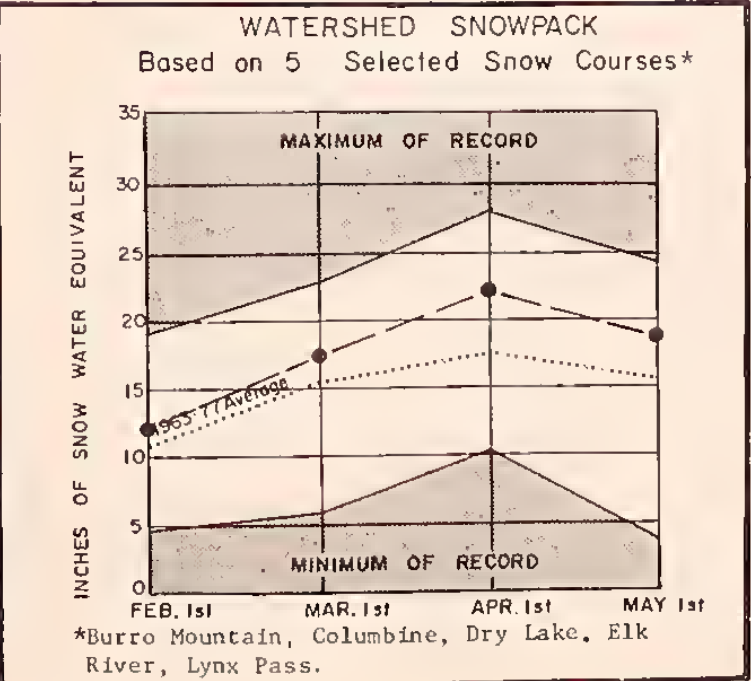
SNOWPACK CONDITIONS REMAIN ESSENTIALLY THE SAME AS THE APRIL 1 SURVEYS WITH AREAS AT OR SLIGHTLY ABOVE AVERAGE. THE ONLY EXCEPTION BEING THE ELK RIVER WHICH IS WELL ABOVE AVERAGE AT 132% OF NORMAL. STREAMFLOW FORECASTS ARE GOOD, RANGING FROM 20% TO 30% ABOVE AVERAGE ON THE WHITE AND LITTLE SNAKE RIVERS, RESPECTIVELY. PRECIPITATION IN THE AREA HAS BEEN ABOVE AVERAGE FOR THE MONTH OF APRIL. WATER SUPPLIES SHOULD BE GOOD FOR THE COMING YEAR. MELT DURING APRIL WAS CONFINED TO AREAS ABOVE 9000 FEET.

STREAMFLOW FORECASTS (1000 Ac. Ft.) April - September

FORECAST POINT	Forecast	% of Average	1963-77 Average
Elk River at Clark	255	129	198.0
Laramie River near Woods	155	124	125.0
Little Snake River at Lily	455	130	349.0
North Platte River at Northgate	300	126	238.0
White River near Meeker	345	120	287.0
Yampa River near Maybell	1150	127	905.0
Yampa River at Steamboat Springs	330	121	273.0

WATER SUPPLY OUTLOOK

STREAM or AREA	Flow Period	
	Spring Season	Late Season
Canadian River	Exc.	Avg.
Hunt Creek	Exc.	Avg.
Illinois River	Exc.	Avg.
Michigan River	Exc.	Avg.
Oak Creek	Exc.	Avg.
Trout Creek	Exc.	Avg.



SUMMARY of SNOW MEASUREMENTS

RIVER BASIN and SUB-WATERSHED	Number of Courses Averaged	THIS YEAR'S SNOW WATER AS PERCENT OF	
		1963-77 Average	1963-77 Average
Elk	2	87	132
Laramie	3	97	125
North Platte	5	93	112
White	2	96	124
Yampa	8	96	121

SNOW COURSE MEASUREMENTS

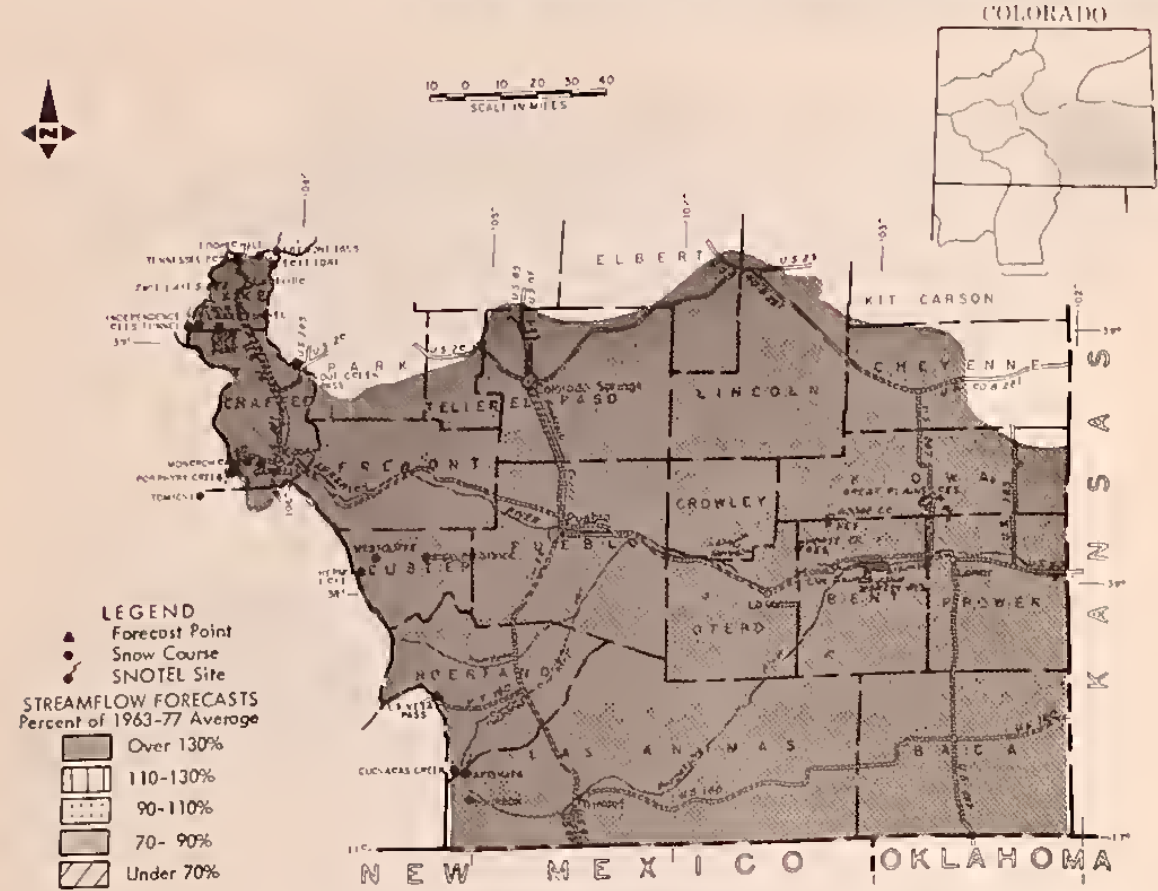
SNOW COURSE	CURRENT INFORMATION			PAST RECORD	
	DATE OF SURVEY	SNOW DEPTH (INCHES)	WATER CONTENT (INCHES)	WATER CONTENT (INCHES)	AVG. 1971-77
NORTH PLATTE BASIN					
<u>Laramie River</u>					
Deadman Hill	NS	--	---	20.8	17.8
McIntyre	4/27	34	13.4	14.4	10.7
Roach	4/27	65	25.2	26.8	19.5
<u>North Platte River</u>					
Cameron Pass	4/28	68	31.0	31.0	32.1
Columbine Lodge	4/28	50	23.6	23.8	20.7
Northgate	4/29	21	7.3	4.4	4.1
Park View	4/29	23	7.6	12.2	6.8
Willow Cr. Pass (B)	4/29	38	13.7	18.0	10.8
YAMPA BASIN					
<u>Elk River</u>					
Elk River	4/29	40	18.6	22.0	16.1
Hahn's Peak	4/29	31	14.6	16.2	9.1
<u>White River</u>					
Burro Mountain	4/28	42	17.4	18.3	14.9
Rio Blanco	4/29	34	14.0	14.4	10.4
<u>Yampa River</u>					
Bear River	4/30	29	11.4	9.9	7.5
Columbine (B)	4/28	50	23.6	23.8	20.7
Crosho	4/30	41	16.7	13.8	11.8
Dry Lake	4/25	57	24.4	25.9	17.8
Lynx Pass (B)	4/28	28	10.5	13.0	8.7
Rabbit Enrs	4/28	64	29.6	30.7	27.1
Tower	4/28	131	59.4	65.2	53.5
Yampa View	4/28	33	14.3	15.9	9.8

NS-No survey.
(B)-On adjacent drainage.



1.7
B.3

ARKANSAS RIVER WATERSHED IN COLORADO



YOUR WATER SUPPLY

BELOW NORMAL TEMPERATURES AND ABOVE AVERAGE PRECIPITATION DURING THE MONTH OF APRIL HAS HELPED TO IMPROVE AN ALREADY EXCELLENT SNOWPACK. THE ARKANSAS IS NOW 177% OF NORMAL AS COMPARED TO 135% OF NORMAL ON APRIL 1. THE CUCARAS AND PURGATOIRE DRAINAGES ARE MORE DRAMATIC INCREASING FROM 142% TO 377% OF NORMAL AND 154% TO 374% OF NORMAL, RESPECTIVELY. STREAMFLOW FORECASTS ARE EXCELLENT WITH ALL FORECAST POINTS WELL ABOVE AVERAGE. MOST RESERVOIRS ARE SHOWING SUBSTANTIAL INCREASES.

STREAMFLOW FORECASTS (1000 Ac. Ft.) April - September

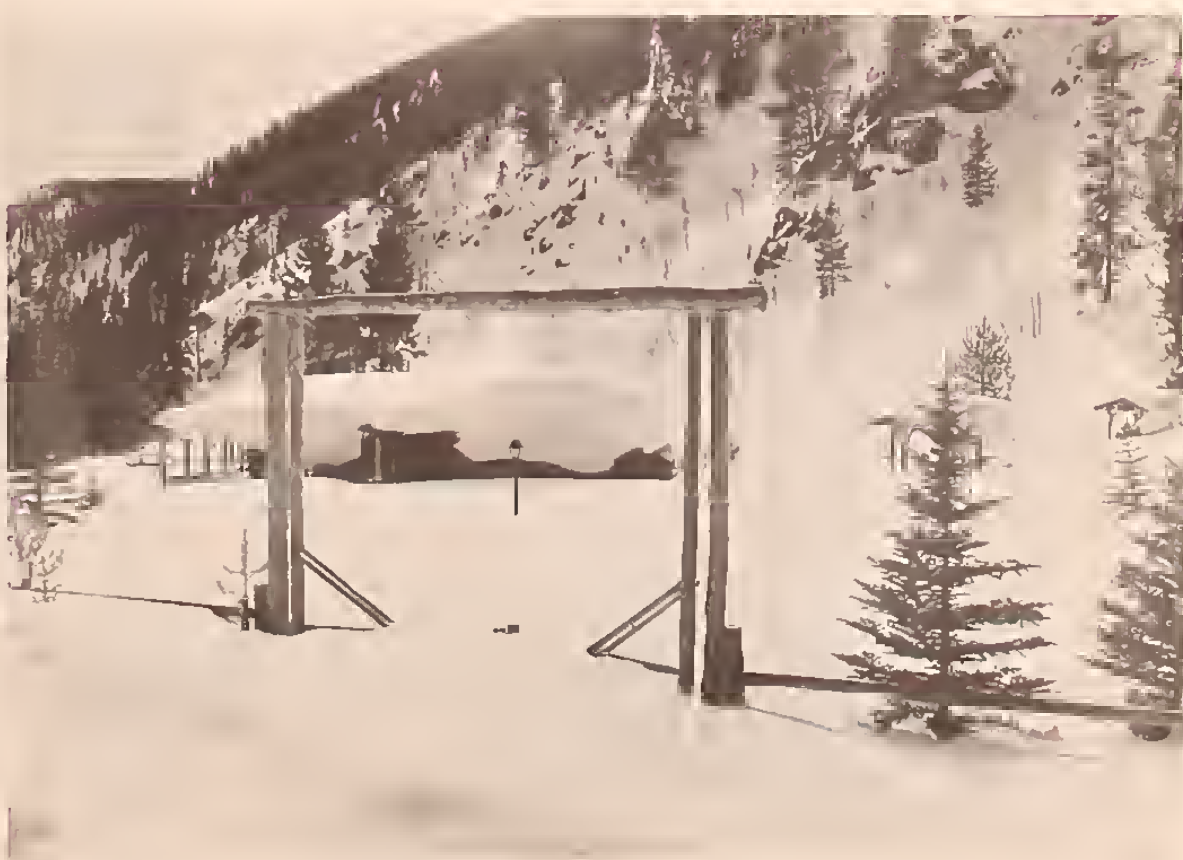
FORECAST POINT	Forecast	% of Average	1963-77 Average
Arkansas River near Pueblo (1)	430	165	260.0
Arkansas River at Salida (2)	410	142	280.0
Cucharas River near La Veta	15	165	9.1
Huerfano River near Redwing	20	149	13.4
Purgatoire River at Trinidad (3)	55	168	32.8
Grape Creek near Westcliffe	28	175	16.0

RESERVOIR STORAGE (thousand Ac. Ft.) END OF MONTH

Basin of Stream and of Reservoir	Usable Capacity	Usable Storage		
		Thru Year	Last Year	1963-77 Average
Adobe	60	1	0	11
Clear Creek	11	8	2	7
Great Plains	150	0	0	42
Holbrook Lake	7	6	0	-
Horse Creek	27	20	14	4
John Martin	621	45	15	39
Lake Henry	8	7	4	-
Meredith	42	0	0	9
Pueblo	351	68	38	-
Trinidad	158	23	2	-
Turquoise	121	68	73	30
Twin Lakes	58	33	17	22

WATER SUPPLY OUTLOOK

STREAM or AREA	Flow Period	
	Spring Season	Late Season
Apishapa River	Exc.	Exc.
Fountain Creek	Exc.	Avg.
Hardscrabble Creek	Exc.	Avg.
Monument Creek	Exc.	Avg.



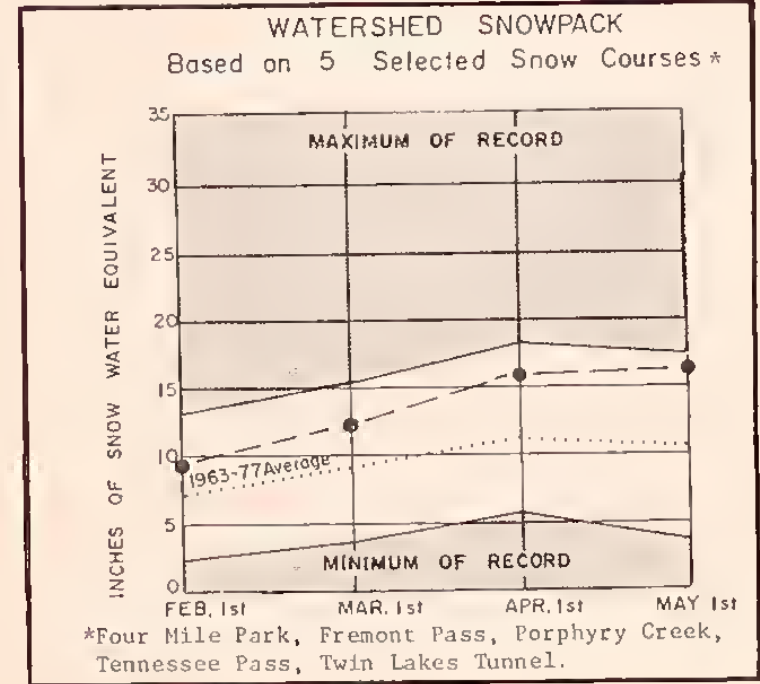
SUMMARY of SNOW MEASUREMENTS (COMPARISON WITH PREVIOUS YEARS)

RIVER BASIN AND SUB-WATERSHED	Number of Courses Averaged	THIS YEAR'S SNOW WATER AS PERCENT OF	
		Last Year	1963-77 Average
Arkansas	11	150	177
Cucharas	2	448	377
Purgatoire	1	1443	374

SNOW COURSE MEASUREMENTS

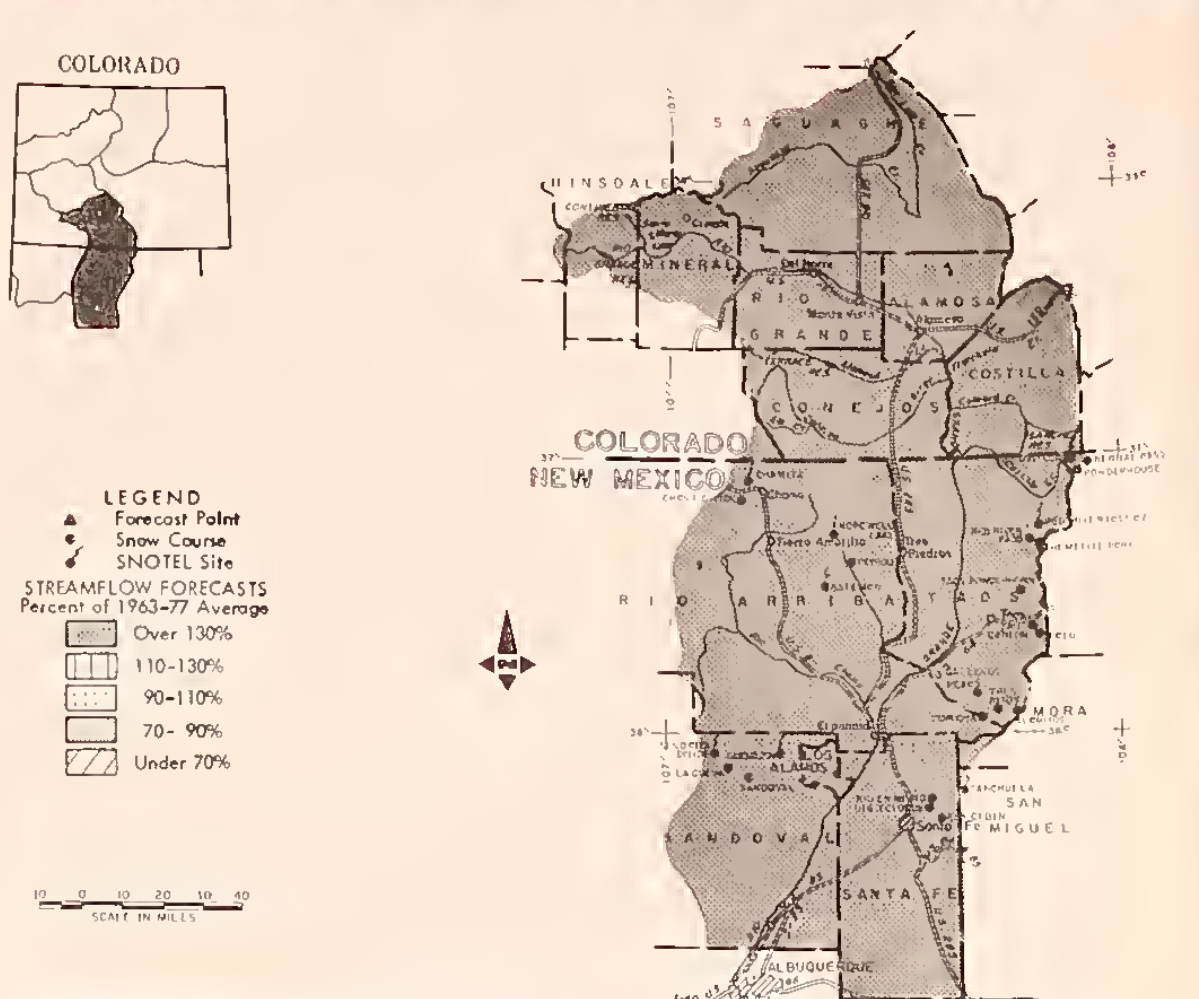
SNOW COURSE	CURRENT INFORMATION			PAST RECORD	
	DATE OF SURVEY	SNOW DEPTH (INCHES)	WATER CONTENT (INCHES)	WATER CONTENT (INCHES)	
				LAST YEAR	AVG. 1977
ARKANSAS BASIN					
<u>Arkansas River</u>					
Bigelow Divide	4/29	43	14.8	6.4	4.7
Brumley	4/28	40		---	---
Cooper Hill (B)	4/28	52	17.9	14.4	11.7
East Fork	4/28	34	11.6	7.6	7.3
Four Mile Park	4/28	18	6.8	2.0	1.6
Fremont Pass	4/28	63	23.4	17.0	17.7
Garfield	4/29	50	22.0	10.7	9.5
Hermit Lake	4/30	30	11.3	7.5	6.8
Monarch Pass	4/29	60	23.5	17.4	15.3
South Colony	4/29	66	27.2	34.8	---
Tennessee Pass	4/28	37	12.4	11.5	7.4
Twin Lakes Tunnel	4/29	38	15.3	13.2	9.5
Westcliffe	4/28	23	7.8	3.6	2.5
<u>Cucharas River</u>					
Apishapa	4/28	46	11.9	0.0	3.7
Cucharas Creek	4/28	53	14.6	4.6	---
La Veta Pass (B)	4/28	48	14.1	5.8	3.2
Huerfano	4/27	42	12.2	---	---
<u>Purgatoire River</u>					
Bourbon	4/30	35	10.1	0.7	2.7
Whiskey Creek	4/30	44	12.2	3.0	---

NS-No survey.
(B)-On adjacent drainage.



*Four Mile Park, Fremont Pass, Porphry Creek, Tennessee Pass, Twin Lakes Tunnel.

RIO GRANDE WATERSHED IN COLORADO AND NEW MEXICO



RESERVOIR STORAGE (thousand Ac. Ft.) END OF MONTH

Basin of Stream and of Reservoir	Usable Capacity	Usable Storage		
		Thru Year	Last Year	1963-77 Average
COLORADO				
Continental	27	8	7	5
Platoro	75	20	15	10
Rio Grande	51	42	9	19
Sanchez	103	22	9	11
Santa Maria	45	13	8	7
Terrace	18	8	2	7
NEW MEXICO				
Avalon	5	2	2	1
Caballo	344	92	61	66
Conchas	273	67	91	122
El Vado	195	123	52	52
Elephant Butte	2195	938	290	348
McMillan	34	16	6	12
Sumner	11	55	44	42

WATER SUPPLY OUTLOOK

STREAM or AREA	Flow Period	
	Spring Season	Late Season
COLORADO		
Sangre de Cristo Cr	Exc.	Exc.
Trinchera Creek	Exc.	Exc.
NEW MEXICO		
Embudo Creek	Exc.	Exc.
Mora River	Exc.	Exc.
Nambe Creek	Exc.	Exc.
Rio Ojo Caliente	Exc.	Exc.
Santa Fe Creek	Exc.	Exc.

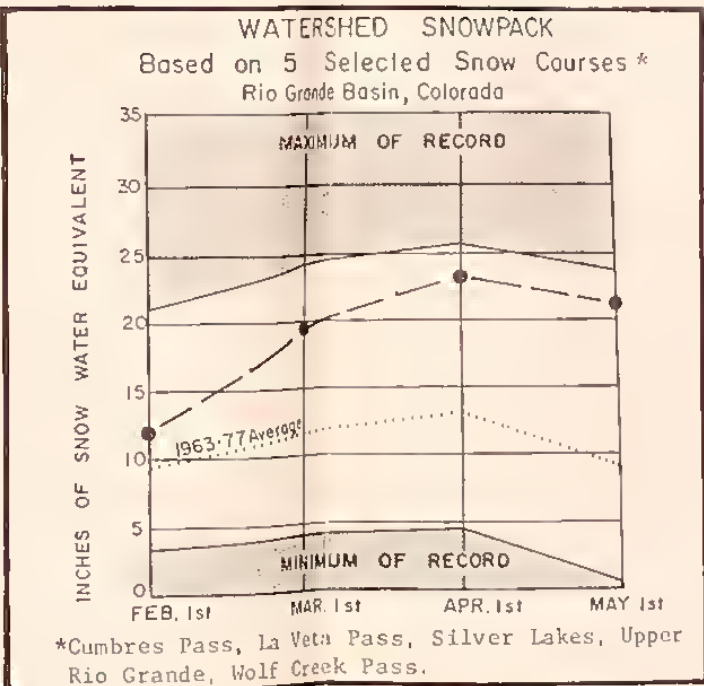
SUMMARY of SNOW MEASUREMENTS (COMPARISON WITH PREVIOUS YEARS)

RIVER BASIN AND SUB-WATERSHED	Number of Courses Averaged	THIS YEAR'S SNOW WATER AS PERCENT OF	
		Last Year	1963-77 Average
COLORADO			
Alamosa	1	75	113
Conejos	6	106	226
Culebra	3	110	251
Rio Grande, CO	12	75	176

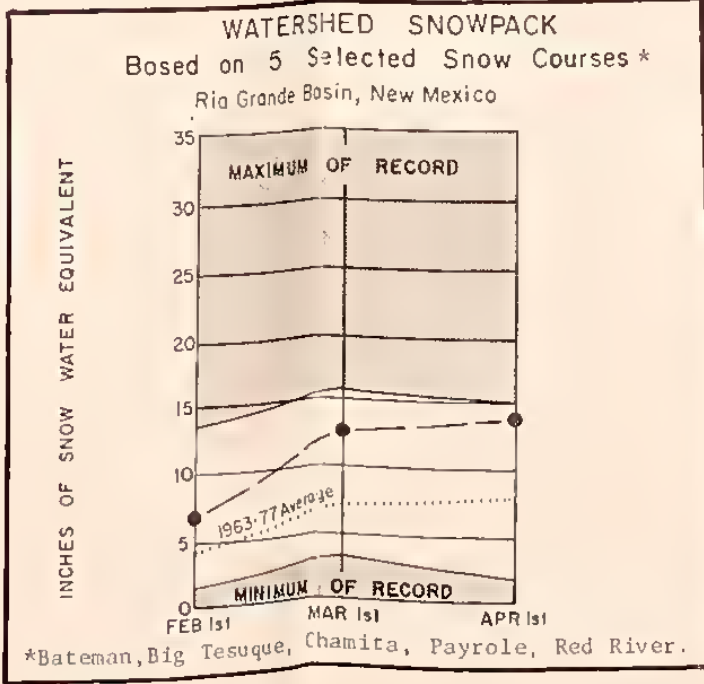
SNOW COURSE MEASUREMENTS

SNOW COURSE	CURRENT INFORMATION			PAST RECORD	
	DATE OF SURVEY	SNOW DEPTH (INCHES)	WATER CONTENT (INCHES)	LAST YEAR	AVG. 1963-77
RIO GRANDE BASIN-COLO.					
Alamosa River					
Lily Pond	4/29	55	23.0	---	---
Silver Lakes	4/29	5	1.8	2.4	1.6
Conejos River					
Cumbres Pass	4/23	78	37.6	33.3	14.7
Cumbres Trestle	4/28	96	45.8	43.7	17.7
La Manga	4/28	72	31.3	30.9	16.7
Pinos Mill	4/30	83	41.0	39.3	18.1
Platoro	4/29	52	23.5	23.0	11.8
River Springs	4/29	2	0.8	0.0	0.7
Culebra River					
Brown Cabin	4/28	26	7.7	---	1.9
Culebra	4/28	41	11.3	15.1	5.2
La Veta Pass (B)	4/28	48	14.1	5.8	3.2
Trinchera (B)	4/29	40	11.0	12.1	6.1
Rio Grande					
Big Meadows	4/25	55	22.4	24.3	10.0
Cochetopa Pass	4/28	23	7.5	7.4	4.0
Grayback	4/25	57	19.8	25.8	13.2
Hiway	4/29	91	40.3	48.1	26.0
Lake Humphrey	4/27	21	7.3	14.2	2.1
Love Lake	4/28	32	12.2	18.2	6.0
Middle Creek	4/28	68	27.3	42.2	---
Pass Creek	4/29	40	16.1	23.4	5.3
Pool Table	4/28	23	5.9	12.2	3.1
Porcupine	4/28	31	10.6	18.2	6.6
Santa Maria	4/27	8	2.5	6.1	1.4
Upper Rio Grande	4/27	24	10.2	14.7	3.5
Wolf Creek Pass	4/29	90	42.5	46.8	22.8
Wolf Cr. Summit (B)	4/29	101	44.4	56.4	30.8

NS-No survey.
(B)-On adjacent drainage.



*Cumbres Pass, La Veta Pass, Silver Lakes, Upper Rio Grande, Wolf Creek Pass.



*Bateman, Big Tesuque, Chamita, Payrole, Red River.

YOUR WATER SUPPLY

THE MOUNTAIN SNOWPACK REMAINS EXTREMELY HIGH IN BOTH COLORADO AND NEW MEXICO. IN THE RIO GRANDE BASIN IN COLORADO SNOWPACK NOW RANGES FROM 176% TO NORMAL IN THE HEADWATERS ABOVE DEL NORTE TO ABOUT 250% OF NORMAL ON THE WEST SIDE OF THE SANGRE DE CRISTO RANGE. THE CONEJOS WATERSHED HAS A SNOWPACK WHICH EXCEEDS LAST YEAR. CUMBRES PASS SNOW COURSE IS NEAR THE RECORD SET IN 1941. STREAMFLOWS ARE EXPECTED TO GENERALLY BE BETWEEN 45 AND 75% ABOVE AVERAGE.

SPECIAL SNOW SURVEYS TAKEN IN NEW MEXICO CONTINUE TO SHOW AN EXTREMELY HEAVY SNOWPACK IN THE RIO CHAMA WATERSHED. RUNOFF PREDICTIONS RANGE FROM 1.5 TO 3 TIMES NORMAL ON ALL STREAMS. GOOD LATE SEASON FLOWS CAN BE EXPECTED OVER THE ENTIRE RIO GRANDE BASIN. CARRYOVER RESERVOIR STORAGE REMAINS TWICE NORMAL.

STREAMFLOW FORECASTS (1000 Ac. Ft.)

FORECAST POINT	Forecast	% of Average	1963-77 Average
COLORADO (April-September)			
Alamosa Creek above Terrace Reservoir	110	173	63.6
Conejos River near Mogote (1)	325	178	183.0
Culebra Creek at San Luis (2)	26	170	15.3
La Jara Creek near Capulin	11	145	7.6
Los Pinos River near Ortiz	110	179	61.3
Rio Grande at Thirty Mile Bridge (3)	170	143	119.0
Rio Grande near Del Norte (3)	710	154	462.0
Saguache Creek near Saguache	37	123	30.1
San Antonio River at Ortiz	33	270	12.2
South Fork of Rio Grande at South Fork Trinchera Water Supply (April-July)(6)	190	160	119.0
NEW MEXICO (March-July)	38	174	21.9
NEW MEXICO (March-July)			
Costilla Creek at Costilla (4)	28	182	15.4
Jemez River near Jemez	55	165	33.3
Pecos River at Pecos	66	174	38.1
Red River at Mouth	42	154	27.2
Rio Chama at El Vado	490	277	177.0
Rio Grande at Otowi (5)	1340	270	497.0
Rio Grande at San Marcial (5)	1100	328	335.0
Rio Hondo near Valdez	22	174	12.8
Rio Pueblo de Taos near Taos	28	147	19.0
Santa Cruz River at Cundiyo	22	190	11.6

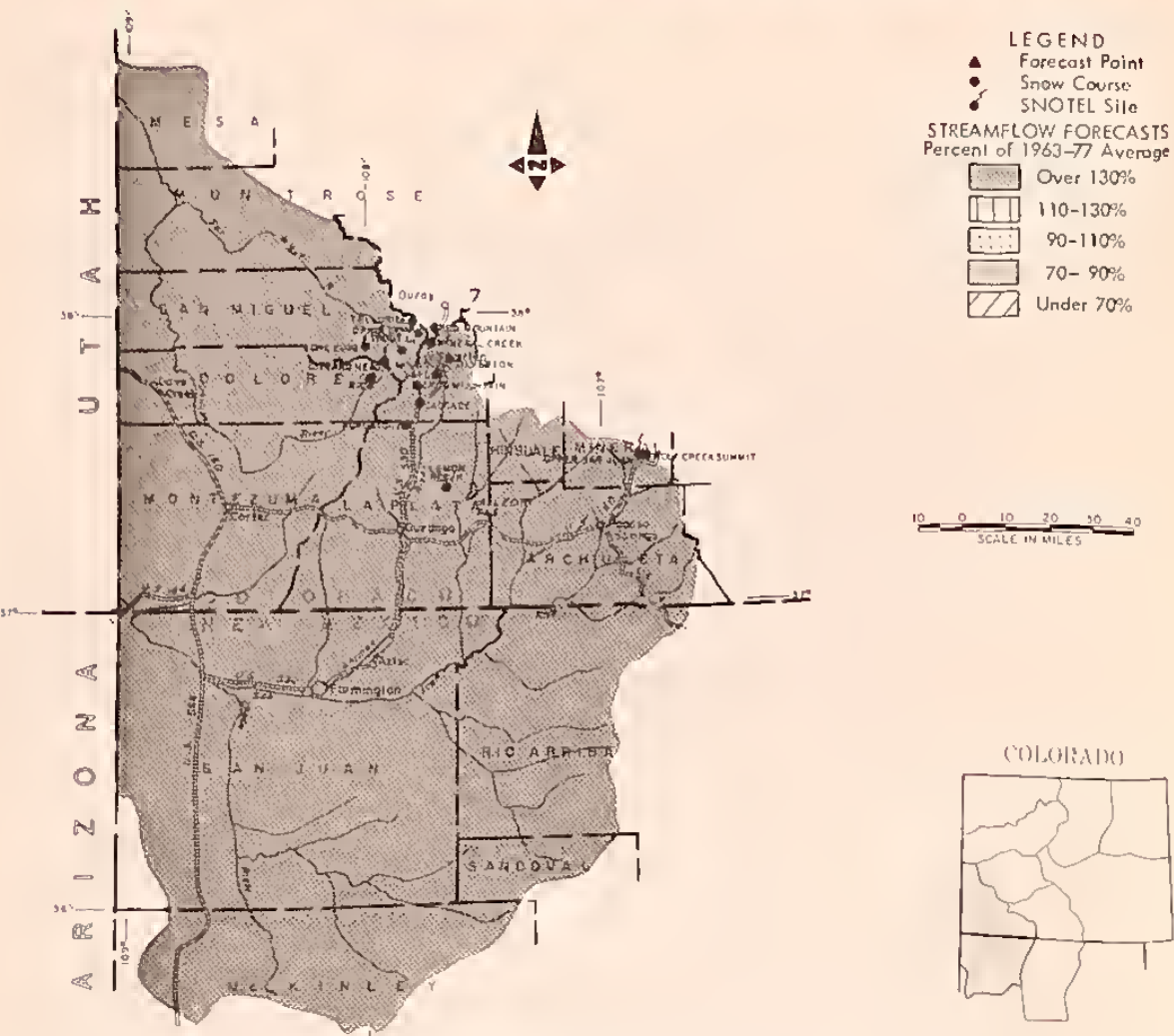
1)Flow change in storage in Pecos Reservoir. 2)Flow change in storage in Conejos Reservoir. 3)Flow change in storage in Santa Maria, Rio Grande and Continental Reservoirs. 4)Flow change in storage in Trinchera Reservoir. 5)Flow change in storage in El Vado and Alamo Reservoirs. 6)Flow change in storage in the South Fork of Rio Grande at South Fork Trinchera Reservoir. 7)Flow change in storage in the Rio Chama at El Vado.

SNOW COURSE MEASUREMENTS

SNOW COURSE	CURRENT INFORMATION			PAST RECORD	
	DATE OF SURVEY	SNOW DEPTH (INCHES)	WATER CONTENT (INCHES)	LAST YEAR	AVG. 1972
RIO GRANDE BASIN - NM					
Bateman	4/29	42	17.3	15.4	---
Chamita	4/30	19	7.3	10.1	0.7
Hopewell	4/30	52	24.4	25.2	13.3
Red River Pass #2	4/28	16	5.3	6.1	---
Rio En Medio	4/29	30	11.3	11.3	3.2
Gallegos Peak	4/28	29	9.4	---	---
Palo	4/28	21	7.0	2.7	---
Panchuela	4/29	0	0.0	0.4	---
Quemazon	4/28	32	11.8	10.8	---



SAN MIGUEL, DOLORES, ANIMAS AND SAN JUAN WATERSHEDS IN COLORADO AND NEW MEXICO



YOUR WATER SUPPLY

PROSPECTS OF HIGH FLOWS REMAIN NEARLY THE SAME AS A MONTH AGO. STREAMFLOWS ARE EXPECTED TO RANGE FROM 53% ABOVE NORMAL ON THE SAN MIGUEL RIVER TO NEARLY TWICE NORMAL ON THE PIEDRA RIVER. THE MOUNTAIN SNOWPACK REMAINS 70-80% ABOVE NORMAL FOR THIS TIME OF YEAR. SOME LOCALIZED FLOODING IN LOW-LYING AREAS ADJACENT TO STREAMS CAN BE EXPECTED WHEN STREAMS PEAK IN LATE MAY AND EARLY JUNE. STREAMS WILL REMAIN HIGH LATER THAN NORMAL INTO THE SUMMER AS A RESULT OF THE ABNORMALLY HIGH SNOWPACK.

STREAMFLOW FORECASTS (1000 Ac. Ft.) April - September

FORECAST POINT	Forecast	% of Average	1963-77 Average
Animas River at Durango	670	158	425.0
Dolores River at Dolores	390	167	233.0
La Plata River at Hesperus	45	191	23.5
Los Pinos River at Bayfield (1)	335	164	204.0
Mancos River near Towac (2)	38	174	21.9
Inflow to Navajo River (1 & 3)	1150	189	608.0
Piedra Creek at Arboles	400	199	201.0
San Juan River at Carracas	660	178	370.0
San Miguel River at Placerville	190	153	124.0

(1) Observed flow plus change in storage in Tellerito Reservoir. (2) March-July. (3) April-July.

WATER SUPPLY OUTLOOK Expressed as "Poor, Fair, Average, Excellent" With Respect to Usual Supply

STREAM or AREA	Flow Period	
	Spring Season	Late Season
Florida River	Exc.	Exc.
Hermosa Creek	Exc.	Exc.
West Dolores River	Exc.	Exc.
Williams Creek	Exc.	Exc.

RESERVOIR STORAGE (Thousand Ac. Ft.) END OF MONTH

Basin or Stream and/or RESERVOIR	Usable Capacity	Usable Storage		
		This Year	Last Year	1963-77 Average
Groundhog	22	10	9	12
Jackson Gulch	10	4	3	7
Lemon	40	17	9	23
Navajo	1696	1181	1260	741
Vallecito	126	42	33	66

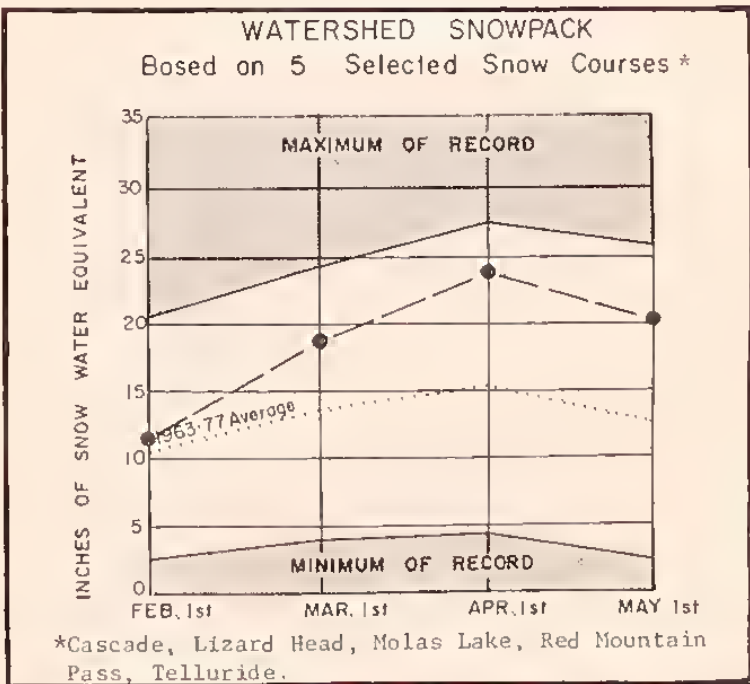
SUMMARY of SNOW MEASUREMENTS (COMPARISON WITH PREVIOUS YEARS)

RIVER BASIN and/or SUB-WATERSHED	Number of Courses Averaged	THIS YEAR'S SNOW WATER AS PERCENT OF	
		Last Year	1963-77 Average
Animas	8	79	171
Dolores	5	110	211
San Juan	4	83	179

SNOW COURSE MEASUREMENTS

SNOW COURSE	CURRENT INFORMATION			PAST RECORD	
	DATE OF SURVEY	SNOW DEPTH (INCHES)	WATER CONTENT (INCHES)	WATER CONTENT (INCHES)	
				LAST YEAR	AVG. 61-77
SAN JUAN-DOLORES BASIN					
<u>Animas River</u>					
Cascade	4/28	36	15.9	21.5	5.3
Lemon	4/29	28	12.6	17.1	3.7
Mineral Creek	4/28	50	21.0	24.9	11.5
Molas Lake	4/28	39	17.3	18.7	8.3
Purgatory	4/28	66	28.3	39.4	18.8
Red Mt. Pass (B)	4/28	91	38.8	46.1	31.9
Silverton Sub-Sta.	4/28	14	6.3	10.1	1.6
Spud Mountain	4/28	76	32.8	46.1	21.8
<u>Dolores River</u>					
Groundhog	4/27	31	14.2	14.3	---
Houser Camp	4/29	0	0.0	9.4	---
Lizard Head	4/25	57	23.2	25.0	14.7
Lone Cone	4/28	45	19.9	18.8	10.0
Ophir Loop	4/25	54	20.0	23.6	---
Rico	4/25	27	10.9	3.9	1.3
Telluride	4/25	14	5.5	6.0	2.5
Trout Lake	4/25	48	20.3	18.6	9.3
<u>San Juan River</u>					
Chama Divide (B)	NS	--	---	---	0.0
Chamita (B)	4/30	19	7.3	10.1	0.7
La Plata	4/29	70	36.5	28.4	---
Mancos T-Down	4/29	63	32.0	25.5	---
Upper San Juan	4/29	97	47.4	56.5	24.9
Wolf Cr. Pass (B)	4/29	90	42.5	46.8	22.8
Wolf Cr. Summit	4/29	101	44.4	56.4	30.8

NS-No survey.
(B)-On adjacent drainage.



WATER SUPPLY OUTLOOK BY MAJOR WATERSHED AREAS

-GUNNISON RIVER WATERSHED

Describes water supply conditions in Delta, Gunnison, Cimarron, Shavano, and Uncompahgre Soil Conservation Districts.

-COLORADO RIVER WATERSHED

Describe water supply conditions in DeBeque, Plateau Valley, Mesa, Bookcliff, Eagle County, Middle Park, South Side, and Mt. Sopris Soil Conservation Districts.

-SOUTH PLATTE RIVER WATERSHED

Describes water supply conditions in Fort Collins, Big Thompson, Longmont, Boulder Valley, Jefferson, Teller-Park, Douglas County, Morgan, Kiowa, West Arapahoe, West Adams, East Adams, Platte Valley, Southeast Weld, and West Greeley Soil Conservation Districts. Also describes water supply conditions in Sedgwick, South Platte, Hoxton, Peetz, Podroni, Morgan, Rock Creek, and Yuma Soil Conservation Districts.

-YAMPA, WHITE AND NORTH PLATTE RIVERS WATERSHED

Describes water supply conditions in Yampa, Moffat, West Routt, East Routt, North Park, White River, and Douglas Creek Soil Conservation Districts.

-ARKANSAS RIVER WATERSHED

Describes water supply conditions in Lake County, Upper Arkansas, Fremont, Custer County Divide, Fountain Valley, Black Squirrel, Central Colorado, Turkey Creek, South Pueblo, Olney Boone, Cheyenne, Upper Huerfano, Spanish Peaks, Purgatoire River, Trinchero, Western Baca, Southeastern Baca, Two Buttes, Bent, Timpas, Northeast Prowers, Prowers, Kiowa County, West Otero, East Otero, Prairie, Hi Plains, and Double El Soil Conservation Districts.

-RIO GRANDE WATERSHED

Describes water supply conditions in Rio Grande, Center, Conejos, Mosca Hooper, and Costilla, Soil Conservation Districts. Also describes water supply conditions in Upper Chama, East Rio Arriba, Taos, Lindrieth, Jemez, Santa Fe-Pojoaque, Sandoval, Tijeras, Cuba and Edgewood Soil Conservation Districts.

-DOLORES, SAN JUAN, AND ANIMAS RIVERS WATERSHED

Describes water supply conditions in San Miguel Basin, Dave Creek, Dolores, Mancos, LaPlato, Pine River, San Juan, San Miguel Basin, and Glade Park Soil Conservation Districts.